An Inaugural Thesis,

being

An essay on Blisters.

By Benjr. A. Coates

passed Mar 26. 1818

1818.

1. 2.

Cantharis vittata.

1. Male 2. Female.

B. H. C. del. & col. From specimens given me by T. Say, esq.

Introduction.

Of the importance of Blisters, both in Medicine and Surgery, no one has ever doubted. They are among those primary and indispensable remedies, which a physician would take with him, were he obliged to simplify his apparatus to the greatest possible degree, for the purpose of travelling or inhabiting a savage country. Their utility is as universally acknowledged as it is extensive, and they are most fully entitled, as a means of cure, to the epithet Herculean.

If this is the case, it is in some degree surprising that there should be a great deficiency of writers on the subject. I have, with the exception of Dr. Gough's inaugural thesis, not been able to find it treated of methodically in any book printed of late years, except works of alphabetical reference alone. One would think it as fully entitled to a place among the Materia Medica as any substance whatever; and, accordingly, the present professor of that branch has afforded it notice proportioned to its merits. Dr. Rush has spoken of the medical application of blisters, in his lectures on therapeutics; and we have it to hope that Dr. Chapman will do the same in his anxiously expected second volume.

a few medicated prescriptions of
doubtful efficacy and connected
with the old doctrine &c

It has often struck me that a new, methodical view might be very usefully made, of the Materia Chirurgica. A variety of remedies would be included in such an arrangement, that are of the most acknowledged importance, but that have not received, as far as I know, from any modern author, a treatment suited to their value. It is true that the French have written on the external application of remedies, called "Methode Iatroliptice;" but the subject seems to have been restricted to those articles which had been formerly used internally. They leave entirely out the various common applications, so much depended on in the local treatment of injury and disease, and content themselves with a few medicated frictions whose efficacy is yet doubtful, and which are connected with the old doctrine of cutaneous absorption. Plenck's Pharmacologie Chirurgicale, the only work I have seen pretending to the subject, is a mere catalogue, diluted with all the pedantry of science that his subject would admit of. It also contains a long catalogue of internal remedies, which, however properly introduced, in strict nomenclatural correctness, have all been treated of in common works on Materia Medica.

The arrangement of the articles used for medicinal application to the skin, need not be very complicated; but such a treatise should include the important subject of Coercentia, such as splints, bandages, &c., which have

H "the good old man" as he styles him,
prescribed the internal use of a blistering
ointment (the Mylat &c) but never
availed
himself of their ~~[illegible]~~ employment
externally.

been made the subject of books by the French, but of which we have heard only incidentally, in treating of the practice of Surgery. Whether the subject is worthy attention or not, all will probably agree, that the division I have chosen deserves a separate consideration.

Our remedy, it seems, was known to the Greek physicians. Hippocrates, "the good old man," as Alston styles him, though he employed a blistering insect (the mylabrum cichorei of Linneus) in the stomach, never availed himself of their employment externally. The latter, we find from a reference to Le Clerc's history, is to be attributed either to Aretaeus or Archigenes. In looking over long dry lists of citations of authors, the "loads of learned lumber" with which works of the last age abound, the eye must be excused a digressional notice of an unfortunate physician. "Dr. Groenvelt, who "published, in vindication of his own practice, a small "treatise" de usu Cantharidum usu interno," suffered much "by a prosecution for giving them inwardly, being charged "with and sued for mal-practice. The issue ruined the un-"happy doctor, and taught his envious prosecutors the "safety and value of his practice." Quincy's Pharmac. p. 152.

Hosts of authors' opinions, superseded by mod-

In the old books we find named and quoted a great variety of authors who have written on the subject of blisters;

1

practice, yie
ry. Medicine
not exempt fr
to be hoped tha
sent day, will c
ture of human-
at great varie
the old books, whi
their experien
ten years, and th
ans those of the te
ese accounts are full
ations, &c.; and on
t from the meth
bracel under the
iting such tales;
together such a m
void of useful infe
ctice of it.

In proceedin
have chosen an o
that usually emplo
e article first, b
this method may seem
tical; but we h

Boulderia.

on practice, yield in real interest to this melancholy story. Medicine, it should seem, like other republics, is not exempt from the reproach of ingratitude. It is to be hoped that the conduct of physicians of the present day, will continue to exhibit proofs of the amelioration of human-kind.

A great variety of authors are named and quoted in the old books, who have written on the subject of blisters; but their experience has been improved on by that of after years, and their remarks are now as completely useless as those of the teachers of any other sciences at the time. Their accounts are full of dreadful stories of haemorrhages, mortifications, &c.; and one* asserts that several pounds of blood were lost from the urethra, in consequence of only carrying a parcel under the coat. There can be surely no use in reciting such tales; and indeed the history of this drug is altogether such a mere mass of pedantry, and so totally devoid of useful inference, that I shall take no further notice of it.

In proceeding to speak of the employment of blisters, I have chosen an order of arrangement, different from that usually employed on such occasions, of describing the article first, and then treating of its medical use. This method may seem the more beautiful, as the more synthetical; but we have learned that analysis is infinitely the

* Calderon.

shortest and best way
I shall first sta
the system, & this wil
diseases. After
chemical nature
are best calculated
I shall conclude by enum

shortest and best way of investigating science.

I shall first state the general effects of blisters on the system, & this will naturally lead to their employment in diseases. After this will follow the consideration of the chemical nature of Cantharides, and of the preparations best calculated to answer the desired ends; and I will conclude by enumerating several substitutes.

On the

The use of blist

as well as most u

includes cases of

the general

submitted to e

as to be ca

its phenomen

disease. Dr. Re

principles of the phe

of the simp

unexpected c

first object of

selection, not

the example, be

to confusion, from

others. In like ma

modern princ

found to be ex

revolutionizing

stomach, but th

appearances of blist

It seems now to

Essay on the five

On the medical effects of blisters.

The use of blisters forms, perhaps, one of the most interesting, as well as most useful objects of pathological contemplation. It includes cases of simple stimulation, sufficiently active upon the general system for its effects to be obvious and easily submitted to examination, and at the same time so insulated as to be capable of inspection with less risk of confusing its phenomena with those of other processes of health or disease. Dr. Reid,* in endeavouring to establish the first principles of the philosophy of the human mind from observation of the simplest phenomena, was induced to make the unexpected choice of the sense of smelling, as the first object of his investigations. He was guided, in this selection, not by the prominence and obviousness of the example, but by the less degree in which it was liable to confusion, from complication and association with others. In like manner, I believe, a large number of the modern principles of stimulus and excitement, will be found to be best illustrated, not by the more central and revolutionizing effects which remedies produce in the stomach, but by the comparatively unimportant appearances of blisters.

It seems now to be the prevailing opinion, that these

* Essay on the five Senses.

medies affect the
ving more or les
tions produced
which a stim
en attributed
tere at a greate
ntry. I fear
ce. There is, I
eat, cold and, d
ation being produc
actually applie
rious matters, w
produce heat, p
teries below, with
e separation
ns discharged b
e outside of the
s in fibres and p
portance how m
phenomenon o
tion from remo
te. The only stric
ion remote, is the
rbal disquisition
e know, always

remedies affect the system, not by absorption, but by raising more or less widely extended excitabilities. The actions produced immediately in a part, to the surface of which a stimulating substance is applied, have been attributed to the excitability of the part; and those at a greater distance, to the medium of sympathy. I fear this is a distinction without a difference. There is, I believe, with the sole exceptions of heat, cold and dryness, no instance of a perceptible action being produced in the fibres to which the stimulus is actually applied. In modern views of the subject, various matters, when applied to the surface of the skin, produce heat, pain & dilatation of the calibre of arteries below, with one action entirely new, tending to the separation externally of a fluid, which never was discharged there before. A substance applied to the outside of the skin, produces early and extensive changes in fibres and fluids situated beneath. It is of no importance how we suppose it done; we only know it as a phenomenon of life. Sympathy has been defined action from remote impression; but the expression is indefinite. The only strict meaning which can be applied to the term remote, is that of difference of place. But, without verbal disquisition, action from stimulus is, as far as we know, always similar in its nature and production.

r signifies nothing
duces action in
the distance of
ice of words
effects are just
Nor is the diff
ion of absorption
e of a salivation
ng could only be
ence of the atten
tantity of touching
n. In like man
cantharides to be
on nearer the
such immediate
e medicine is supp
ne is the same wo
All we know, in
the application of
proper use of the
ch of the excitab
t one in its immed
actual contact
pears reasonable to
citability by con

It signifies nothing, so long as impression on one fibre produces action in another, whether they are separated by the distance of a line or of six feet. Though the choice of words may safely be left to the Lexicographer, the effects are just the same.

Nor is the difficulty at all diminished by the hypothesis of absorption. Dr. Dorsey has remarked, in the case of a salivation, that, upon this principle, the mercury could only be supposed to stimulate the inner membrane of the arteries, and, of course, could have no opportunity of touching the moving fibres of the secretory vessels. In like manner, when we suppose the active matter of cantharides to have entered the absorbents of a part, we are no nearer the reason why the arteries and blood undergo such immediate changes. And when, after absorption, the medicine is supposed to have entered the blood-vessels, the case is the same with that proposed by the Professor.

All we know, in effect, is that such changes do take place, on the application of such causes; and the expression of this is the proper use of the term "excitability." We know just as much of the excitability of a part to a remote stimulus, as to one in it's immediate neighbourhood, or, in fact, to one in actual contact with it. The only division which appears reasonable to me is into the adjacent, the remote and excitability by contact. I doubt whether the last

The last 2½ pages are the only opinion of no value —

term can be with justice applied at all; as, altho' there is no doubt that heat, cold & the hardness resulting from desiccation are applied to the substance of bodies, we have no proof that the actions resulting from them are not produced in the same way as in other cases; that is, by actions in one set of fibres following the application of the cause to another, and not to its own tissue.

These ideas, it is hoped, will appear less repulsive, from their being unincumbered with new modes of expression. They are designed to be expressed in common language, - such as would suggest itself to any person attempting to say the same thing. They are equally innocent of a tendency to remove the words sympathy and association. These powers constitute a part of the excitability.

The effects of the application of a vesicating substance may be divided into local, general & secondary. Inflammation and serous discharge form the first. The second are, according to the state of the system, indefinitely various; and require to be treated of at particular length. The third consist of effects produced by irritation of particular parts, reacting on the system; and they are probably referable to pressure and distension of tissues containing nerves. These are chiefly manifested in the bladder, but are produced in various parts, when blisters increase irritation already existing.

"Sanguineous System" I think Sanguiferous better
these words are not synonimous —
we may speak of a sanguineous discharge &c

Sanguineous – a pretty word but too
often used – (Laudrieffe)

The first of these
ory. The action
of the part, w
hausting itself by
propagated consider
considerable influe
rose destroying
in whatever man
ing the adjacent
simply by dimin
ndering it less ex
but it diminishes
neighbourhood than
ce of the sanguine
suppose that it ha
sorbents; but of th
free discharge
stinct indeed. F
ed from the respec
ate is still consider
great degree of
neous vessels of th
n and the natu
n previously estab
ns and synovia.

The first of these heads is most important in Surgery. The action it includes consists in a smart inflammation of the part, increasing for some time, and then exhausting itself by effusion of serum. Its effect is propagated considerably beyond the cutis, occasioning a considerable influx of blood to the parts adjacent, and of course destroying any weaker action subsisting there before. In whatever manner it at first acts, - whether by evacuating the adjacent vessels and allowing them to contract, or simply by diminishing the vital power in the part, and rendering it less excitable, - it is pretty generally conceded that it diminishes all those actions in its immediate neighbourhood that are directly associated with the distention of the sanguineous system. It is natural enough to suppose that it has this effect on all; for example, on the absorbents; but of this we have no proof. When, however, the free discharge is once established, the effects become very distinct indeed. From the great quantity of fluid evacuated from the vessels, it is evident that, notwithstanding there is still considerable increase of excitement in the skin, a great degree of direct debility is induced in all the sanguineous vessels of the neighbouring parts. Inflammation and the natural circulation are diminished, as also previously established secretions, such as those of pus and synovia.

According to the v
which I cannot help
should be greatly i
be translated into
with the blood -
the absorbents & the
retory vessels. Th
a great number
It is in this way
limbs, not o
tion, but often
powers. Thus bl
in tetanus, the
the blood vessels are
It is not mechanic
sel to small & b
ption. It is the ex
secretory apparatus
the news-papers, of a
Here too we see how
m, &c. are gradually
tion in many ca
pressure to exist
The effects of
subject of so mu

Hunt's observations on

According to the improved doctrine of excitability, to which I cannot help feeling much attached, this power should be greatly increased, and should naturally flow or be translated into those parts of other systems in contiguity with the blood-vessels. This will increase the actions of the absorbents & their preponderancy over the debilitated secretory vessels. This corresponds with the practical belief of a great number of physicians.

It is in this way that blisters about stiff, rheumatalgic joints & limbs, not only diminish the soreness consequent to motion, but often very evidently increase muscular power. Thus blisters applied to the part cure palsy; - just as in tetanus, the most violent of all muscular actions, "the bloodvessels are in a state of reduced excitement.*" It is not mechanical pressure in a common ascites on a vessel so small & buried as a lymphatic that prevents absorption. It is the expenditure of vital power on the arteries & secretory apparatus. A striking case was lately published in the newspapers, of a dropsy cured by powerful bleeding alone.

Here too we see how persons with gutta-serena, tinnitus aurium, &c. are gradually restored to the use of their organs, by depletion, dissection in many cases shows not the least room for supposing pressure to exist.

The effects of blisters on the system generally are a subject of so much importance and variety that it is

* Rush's observations on tetanus.

The effects of blisters on the system generally are of so much importance and variety that their investigation is a fit subject for all ~~[illegible]~~ experienced practitioners. Here at least be

the subject for the e
any person to treat
the list of those who
to attempt things to
of angels and of g
Blisters, like all
different states of the s
differ greatly in gen
usually produce an
remise depletion to
that blisters, however,
markable increase of s
in the Hospital,
were used, severe
prive the patient of s
were discharging
of the whole Europ
was remarkable for
case it indicated a
ing on the idea of
low typhoid fevers t
the system is one
however, their effe
irritating excitem
are particularly

a fitter subject for the experienced practitioner than for a young person to treat of. Here, at least, I shall add one to the list of those whose only merit, or whose folly it was to attempt things too great for their powers. "The glorious vice of angels and of gods."

Blisters, like all other stimuli, act differently in different states of the system. When the excitement does not differ greatly in quantity from that of health, they generally produce an excess, which renders it necessary to premise depletion to a little below the healthy standard. Violent blisters, however, may be produced without any very remarkable increase of volume in the pulse. In three cases in the Hospital, where the more active preparations were used, severe pain was produced, sufficient to deprive the patient of sleep, even for 2 or 3 days, while the blisters were discharging freely, with considerable anxiety, heat of the whole surface and costiveness. Of these, only one was remarkable for an increase of pulse. In the worst case it indicated a degree of debility; and after a small bleeding on the idea of depression, did not rise.

In low typhoid fevers the use of blisters to raise the powers of the system is one of the sinews of medicine. Still, however, their effects are more remarkable as a means of equalizing excitement, than of raising it generally. They are particularly of advantage in cases of determi-

tory to viscera, incl
canal. They raise
the skin & proportion
The termination of
mon, it has neve
; tho' they have been
ch the system was p
e extremely dark
ying in black th
excitement, and
When blisters of cantha
ten alone, it has been
ch Dictionary, (C
ten after 7 or 8 hours,
has, however, been
lied for a few hours,
experienced nurse
ten seen them do so
diseases of high
mischief. When app
inflammation, the
the general system
but they seem to co
destructive league. I
in there is urgent

nations to viscera, including the febrile states of the alimentary canal. They raise and soften the pulse, induce moisture on the skin & proportionally diminish the disease.

The termination of blisters in gangrene, either dry or common, it has never fallen to my lot in the Hospital to see; tho' they have been applied in a great number of cases in which the system was prostrated very low. I have seen them look extremely dark and venous; the inflamed rete mucosum hanging in black shreds. But this was in a case of moderate excitement, and was soon relieved by a poultice.

When blisters of cantharides are used for the purpose of stimulation alone, it has been recommended by a writer in the French Dictionary, (Barbier. Art. Vesicat.) to remove the blister after 7 or 8 hours, and reapply it in some other place. It has, however, been told us by our professors, that blisters, when applied for a few hours, will draw very well under a poultice. An experienced nurse in the Hospital told me she had often seen them do so under dressings of simple cerate. In diseases of high action, blisters are acknowledged to do mischief. When applied to parts remote from the seat of inflammation, they increase the evil thro' the medium of the general system. But when near the inflamed part they seem to coalesce with the disease & form a destructive league. The preventive is depletion; which, when there is urgent necessity for the blister, as in some

When used in inflammatory fevers or applied to peculiarly irritable constitutions, they produce violent inflammation and consequent aggravation of all the febrile ~~[illegible]~~ symptoms.

tions of the lungs
ing the time in co
In the depressed
ne, intentionally
to bleeding.
emorrhages from the
useful effect.
The indirect effe
e one the result of
ting; and often ne
pitious phenomenon
When these agents are
tors, or I believe are
lame with violence
considerable effection
ne designed, it is
and a poultice.
Blisters on the hea
fever than on any
the roots of the hair
apart from the pro
dalon is diseased,
ne, blisters produc
mark in the Ho
ity while blisters

affections of the lungs, should often be repented by bleeding during the time in which the blister is drawing.

In the depressed state of the system, blisters are not, I believe, intentionally used. By Rush in the yellow fever, only after bleeding. It is, I believe, in malignant cases, that hemorrhages from blisters occur. It must, in most cases, have a useful effect.

The indirect effects of these remedies are of two kinds. The one the result of an increase of an irritation already existing; and often near the place of application; the other the mysterious phenomenon of Strangury.

When these agents are applied to peculiarly irritable constitutions, or I believe are used in inflammatory fevers, they inflame with violence, and the reaction of this has a very considerable effect on the febrile symptoms. As this is never designed, it is to be cured by attention to the system, and a poultice.

Blisters on the head always produce more irritation & fever than on any other part. This arises in part from the roots of the hair confining the inflamed skin, and in part from the proximity of the brain. When the encephalon is diseased, and the arteries are not reduced in force, blisters produce violent symptoms. It is a general remark in the Hospital that lunatics are always more noisy while blisters are drawing on the head; tho' the

mark has not
Blisters to the in
g, when applying
ll instances, of w
e made worse b
ttons.

Strangury
the quantity of ca
cepting the alimen
vented by applyi
e blister. If
e loss to explai
I had thought
ate action; but u
and only in f
I thought it did
In the accoun
vented hereafter, d
fforded by urine a
there is an analog
These facts, and the
n blisters before
ne the most poi
ne of the doctrine
This were affec

remark has not been made of other parts.
Blisters to the inflamed scrotum often produce great distress, when applying one to the sacrum will give relief. All instances, of which there are many, where phlegmasiæ are made worse by blisters, afford examples of their indirect action.

Strangury occurs irregularly, and with no relation to the quantity of cantharides applied, nor to the place, without excepting the alimentary canal. It is said to be often prevented by applying a piece of fine muslin over the blister. If this be the case, I am entirely at a loss to explain it.

I had thought that strangury was entirely a sympathetic action; but why it should be determined to the bladder, and only in particular cases, remained, on this supposition, as I thought it did on that of absorption, quite inexplicable.

In the account of a chemical analysis of cantharides inserted hereafter, it will be shewn that several products afforded by urine and cantharides are the same; and that there is an analogy between two of the most important. These facts, and the observation of Dr. Griffitts, that removing blisters before the cuticle separates, prevents strangury, are the most pointed arguments I know of, in favour of the doctrine of absorption.

This severe affection is, in general, easily cured by

...tiful draughts ...
... in the greater ...
... however, that ...
...ulgy inous drinks ...
...ivel says that it ...
...ts on the head ...
...ing. This incon...
...sman, with sa...
...perienced practitio...
...rgery by remov...
...separation of the ...
...proof of absorp...
...pain is the prin...
...the system. T...
...is often unnotice...
...found by Ru...
...ne.

The use of blister...
...what goes before, ...
...prescription in prac...
...rough knowledge ...
...own judgment. ...
...is one of the epi...
...using this remed...
...the blistering point

plentiful draughts of water, and by camphor, opium, &c., in the greater number of instances. Dr. Fordyce says, however, that it does occur in some cases where mucilaginous drinks had been given from the beginning. Percival says that it may sometimes be prevented from blisters on the head, by leaving it exposed for 24 hours after shaving. This inconvenient delay has been shortened by Dr. Chapman, with satisfaction. Dr. Griffitts, a sufficiently experienced practitioner to advise on any subject, prevents strangury by removing the blister just before the expected separation of the cuticle. This the Doctor considers as a proof of absorption being its cause.

The pain is the principal means by which strangury affects the system. Though this accompanies all blisters, it is often unnoticed; but when from strangury, it has been found by Rush to promote the cure of the yellow fever.

The use of blisters seems, in fevers, sufficiently obvious from what goes before, to require no particular detail. The prescription in particular circumstances must, after a thorough knowledge of the disease, be left to the practitioner's own judgment. As an example of this, the late Dr. Rush, in one of the epidemic yellow fevers, found advantage from using this remedy before the system had descended to the blistering point, for the express purpose of producing

(possibly) – this word unnecessary here)

a more powerful disease, where they were placed.

Where continued stimulus is desired, apply them in succession. To produce a powerful impression, apply a large number at once.

Gangrene, we are told, sometimes occurs when it could not be possibly suspected. Where, from the lowness of the system, or any other cause, such a termination is feared, they should be placed on or near the trunk.

In Phlegmasia our remedy is of the first importance. In all these the caution is requisite, and of necessity proportioned to the value of the part, to deplete sufficiently before their use. In the Hospital it has been a frequent practice, with evident advantage, to bleed topically, by cups or leeches, previous to blistering. This has been principally done by Dr. Hartshorne, and most used in cases of accidental injuries and of insanity. It is from neglect of sufficient previous depletion that authors have disputed the utility of the remedy. With this precaution it may be safely employed in all.

With phlegmasia of the head I rank Hydrocephalus, and many neuroses.

In epilepsy, convulsions of children, even from pressure during labour, in Chorea and in Head-ach, cases require blisters. In Apoplexy, Cullen and others put blisters on the head. Dr. Klapp applies them on the feet, and thinks it is an advantage.

In Palsy they ar
ticable in pa
the nerves, at th
In ophthalmia
ving the edges of
In deafness, when o
side of the mea
ding lint below
In thoracic infl
subject to the ge
e pain as possible
In Rheum
ander, and frequ
in removing
ints and limbs, wh
There is a state of
y only a sequela
ters have been
ewest ~~ones~~ Pe
tirely unavailing.
Mezza relates
ting general re
ly cured by b
ion miraculous
In gout, their

In Palsy they are said by Dr. Percival to be particularly serviceable in partial affections, when applied along the course of the nerves, at the back of the neck.

In ophthalmia Dr. Physick applies them over the eye, securing the edges of the lids with a piece of adhesive plaster. In deafness, when obstinate, the blister may be applied to the inside of the meatus auditorius with perfect safety, introducing lint below it, towards the membrana tympani. In thoracic inflammations they are invaluable, subject to the general rules, and to be applied as near the pain as possible.

In Rheumatism they are often required in great number, and frequently repeated. They have great agency in removing the stiffness and weakness of the joints and limbs, which Dr. Ruth calls Rheumatalgia. There is a state of palsy closely approaching to this, properly only a sequela of the original disease, in which blisters have been applied to the limb. Two of the severest ~~cases~~ I ever saw, were, however, in 2 cases entirely unavailing.

Mezo relates a case of a pain in the arm, resisting general remedies & produced by a repelled itch, heinly cured by blisters only. To us, this does not seem miraculous.

In Gout, their principal utility is in the retro-

?

dent form, af
ow, with the effe
Inflammatoire tom
ne he would se
ny often must be
ption of the tom
In the Egyptia
ce to blister th
In the dismal
ters form a spe
ty offer a much
s of the mumm
They are used in
ses.

Of the Profluv
in affections of
importance. Th
Inflammatoire. There
tween the skin
ese remedies, in fo
y adapted to excite.
In diarrhoea, whence
ent, blisters are u
heed the disease b
n the wrists, but

cedent form, applied to the feet to produce revulsion, with the effect of translating the disease.

In Cynanche tonsillaris, Dr. Dorsey directs their trial before he would scarify the tonsils. In C. parotidea they often must be applied to the scrotum to prevent absorption of the testicle from sympathy. H

In the Egyptian ophthalmia it is a common practice to blister the whole head.

In the dismal inflammations that follow parturition, blisters form a part of the approved treatment. But they offer a much more certain remedy in inflammations of the mammæ.

They are used in menorrhagia according to circumstances.

Of the Proflavia, they are seldom employed in catarrh; but in affections of the bowels they become of the first importance. The case is here not the same as with the phlegmasiæ. There is a powerful reciprocal sympathy between the skin and the alimentary canal, which these remedies, in particular states of the system, are peculiarly adapted to excite.

In diarrhœa, whenever there is pain resisting common treatment, blisters are useful; and for this reason I have placed the disease here. Dr. Dorsey puts them generally on the wrists, but in violent attacks, on the abdomen.

In the cholera
we recommend
scribes them for
dren infantum
In most of the
were symptoms
and them in hys
In blindness, a
and they are of th
It is here principal
frequently prov
In some cases this
lient, and ifnec
Cow cases are ge
are constant de
Worded by blister
In cutaneous co
merely by creating
This principle th
lids, and indolent
ial ulcers, where
rised from attac
atment with pro
In the debility p
Lorne's decoction

In the cholera of adults, and in diarrhoea infantum they are recommended in cases difficult of cure. Dr. Rush prescribes them for pain and protracted illness in cholera infantum.

In most of the cachexiæ they are used to palliate or cure symptoms; and peculiar circumstances may demand them in hysteria & whooping-cough.

In blindness, deafness, & local swellings of almost every kind they are of the highest importance to the Surgeon. It is here principally the discharge that is of service, and it is frequently produced with the view of promoting absorption. To some cases this kind of discharge is not thought sufficient, and issues or setons are substituted for them. These cases are generally permanent and require a more constant discharge. A purulent matter is also afforded by blisters kept running with savin.

In cutaneous complaints they appear to be of service merely by creating a new action, stronger than the old. On this principle they cure blotches and eruptions of different kinds, and indolent ulcers. In some tedious superficial ulcers, where thin sloughs adhere, great use is derived from alternating powdered cantharides or weak ointment with powdered extract of catechu.

In the debility produced by extensive burns, Dr. Hartshorne's decoction of Cantharides in turpentine has been

ied with basilic
The use of blisters
be repeated. I
flammation the
eformity slough
ithin the reach
ance of its grow
I have left every
e phlegmatic
urn here is stri
ation & treatmen
angrene. If
ffolas cover some
ill spread befor
Dr. Barton ha
ingenious smoke
ind with the ba
ever heard of th
it should. After
the bite to the
ent symptoms
ellieved by them

mixed with basilicon, to form the local dressings.

The use of blisters in mortification is too well known to be repeated. Dr. Physick tells us that in cases without inflammation the remedy did harm; the blistered surface uniformly sloughing. Mortification seems particularly within the reach of blisters, from the general circumstance of its greatest extent being along the Skin.

I have left erysipelas from its station at the head of the phlegmatiæ, to put it here. The species common here is strikingly similar in its progress, termination & treatment to the other actions tending to gangrene. It is necessary to let the blister for erysipelas cover some width of sound skin, as the disease will spread before the remedy has time to operate —

Dr. Barton has recommended, in cases of the bites of poisonous snakes, promptly to blister the glands of the limb with the bark of the Daphne Gnidium. I have never heard of this being done, and do not know why it should. After the communication of the effect of the bite to the system, I can easily conceive that symptoms might call for epispastics and be relieved by them —

Of t

Of all the va
are, yet different
active external
universal and
ven to Cantharid
y means employe
ice this is difficult
substitute.

This is consider
producing less p
t has been tried
paration, so as gre
e space of time
ation is required
sufficient for the a
d to means which
The animal is too
vicatoria to exert
ate French write
observed the anci
thers. To this Pa

Of Cantharides and it's Analysis.

Of all the various substances which physicians have, at different times, employed, for the purpose either of active external stimulation, or of exciting vesication, an universal and decided preference has, at length, been given to Cantharides. It is still, in common cases, the only means employed; and it is almost only in times or places where this is difficult to be procured, that we ever wish for a substitute.

This is considered as owing to the circumstance of its producing less pain in blistering than any thing else that has been tried. It can also be managed by particular preparation, so as greatly to increase its activity, and diminish the space of time necessary for its operation. Where vesication is required in a shorter time than can be made sufficient for the action of cantharides, recourse must be had to means which will be enumerated in a future section.

The animal is too well known by the name of Lytta vesicatoria to excuse filling paper with its natural history. Late French writers, of the first rank, have, however, preserved the ancient and classic denomination, Cantharis. To this I am happy to learn, our American

mologist, J. Say
It is said to be m
it, which must be
is more frequently
icians have en
rican substitute
tata, of which we
kind of brown,
The chemical ana
y unsatisfactory e
e times, of Thom
en copied by all the
l that was known
n a writer, whose
mie. Professor
ting extracts which
substance, possessing
distinct from e
bantharides, by re
be entirely deprive
ing the residuum
ch was said by B
blistering when di
Pelletier denies this
ny such quality at a
ind it.

Dumpril's experiments.
Phil. Lond. med. & p
ry; vol. 2. p. 4

entomologist, T. Say, esq. inclines.

It is said to be mixed, in Europe, with the Melolontha vitis, which must be separated by picking. In this country, it is more frequently purposely sold with some patriotic physicians have endeavoured to promote, as a general American substitute. I mean the Lytta or Cantharis vittata, of which we shall speak. The powder of this is of a kind of brown, verging towards drab.

The chemical analysis of this drug, has, till of late, afforded very unsatisfactory results. The experiments of Lewis, and in later times, of Thouvenel & Beaupoil* appear to have been copied by all the pharmacologists as containing nearly all that was known. They have, however, been lately outthrone by a writer, whose memoir is quoted from the Annales de Chimie. Professor Robiquet** has obtained, from the vesicating extracts which were the ultimate of his predecessors, a substance, possessing this power exclusively, and of properties distinct from either.

Cantharides, by repeated boiling are said by this author to be entirely deprived of the vesicating quality. By treating the residuum with alcohol, a green oil is obtained, which was said by Beaupoil to possess the singular property of blistering when diluted with wax, but not alone — Robiquet denies this substance, as he prepared it, to possess any such quality at all. But to this I objected that he tried it

* Beaupoil's experiments. Nicholson's journal; vol. 8. p. 78 & v. 9. p. 42.
** New Lond. med. & phys. journ.; v. 2. p. 563. Also Eclectic Repository; vol. 2. p. 405.

ained only, as by
ntifying my own
soluble solution
it a declining fire,
described by Dem
pure and mixed
the boiling the wood
black, insoluble
which had been sa
by repeating the pro
prived of the pow
matter for several
small micaceous
ne, and possessing
concentrated depre
had touched, it
hole extent. It
not in neither of
united in nat
the alcohol was at
The other produc
Thouvenel, were
ime; and sulphate,
in in small qu
ight in solution by

unmixed only, as by his own account, he added no wax. In order to satisfy my own mind, I followed his process, and on leaving the alcoholic solution in sand not much above the human heat, and with a declining fire, obtained after 6 hours, a green, waxy matter, as described by Beaupoil. This was applied to the lips and to the arm; both pure and mixed with wax and with cerate, without any effect.

On boiling the watery extract in alcohol, it was divided into a black, insoluble & a yellow, soluble matter, both of which had been said by former chemists to vesicate. By repeating the process, the black matter was here entirely deprived of the power. Afterwards, by agitating the yellow matter for several hours in sulphuric ether, & evaporating, small micaceous plates were obtained, always crystalline, and possessing the peculiar quality in the most concentrated degree. When cerate was applied to the part it had touched, it propagated the blister throughout its whole extent. It was found perfectly soluble in oils; but in neither of the other menstrua used, except as united in nature with the other matters, or when the alcohol was at a boiling heat.

The other products, most of which were detected by Thouvenel, were an animal matter, with phosphate of lime; and sulphate, muriate and carbonate of lime and iron in small quantities; with phosphate of magnesia, kept in solution by acetic acid, and with uric acid.

animals were kill
spection of the vis
; and there off
covered in the re
if it underwen
Practical infe
ard to the medi
ntractitch indeed
ple in the various
ems to afford no m
ation.

The discovery of a
himself, appears p
same substance
an animal produ
cording to Fourc
ied by holding
it has been discover
s. Thompson, the
id products obta
ff-worms, frame
m grasshoppers a
t. A set of observa
which the gradu
ations of science,

Animals were killed for the purpose by bruising, to avoid suspicion of the vinegar used in preparing those for common use; and there afforded the same results. Uric acid was discovered in the recent animals, but disappeared when kept, as if it underwent a spontaneous decomposition.

Practical inferences from these statements, with regard to the medical application of blisters seem very contracted indeed. The easy solubility of the vesicating principle in the various menstrua, by means of it's mixture, seems to afford no new caution for it's pharmaceutical preparation.

The discovery of acetic acid, which our author claims for himself, appears probable enough when we reflect that the same substance has been found in various and dissimilar animal productions. It has been detected in urine, and, according to Fourcroy, Vauquelin and Thenard, exists, disguised by holding salts in solution, as the acid of milk. It has been discovered in the red ant, and, according to Dr. Thompson, there is great reason to believe that the acid products obtained by Chaussier and Dehne from silk-worms, from the melve proscarabeus, & m. majalis, from grasshoppers and from bugs, are all the same with this. A set of observations strikingly illustrative of the manner in which the gradual improvement in the various ramifications of science, approaches, when least expected, the

simplicity of Na

The unexpecte
ough to attract a
a comparison o
several other enume
gine; and there
ple of Robiquet,
said. The one is d
ained with a "ych
the other as crystalli
imal matter, a
ts sensibly attacke
The other sparing
yellow substance.
ated sublimate
cantharides bein
not. The bitter, a
plies traits to hav
ve detected any
ever, ~~as~~ there
ose cannot be un
So not the evolutio
presence of ur
ter alluded to above
composition?

simplicity of Nature!

The unexpected developement of uric acid possesses interest enough to attract a little attention, particularly as it leads to a comparison of the composition of cantharides and urine. Several salts enumerated above have been proved to exist in urine; and there is an analogy between the "vesicating principle" of Robiquet, and the product of distillation from uric acid. The one is described as forming "little crystalline plates," stained with a "yellow fluid", "and again" with greasy matter." The other as crystallized in plates, ill-defined from adhering animal matter, and accompanied by a thin oil. The one not sensibly attacked by cold alcohol, but dissolved when boiling. The other sparingly soluble in alcohol. One stained with a yellow substance. The other yellow, and whitened by repeated sublimation. They differ, however, in the product of cantharides being soluble in water, while the other is not. The bitter, acrid taste, too, ascribed to the latter implies trials to have been made which would probably have detected any vesicating quality it might possess. Still, however, ~~as~~ there is some analogy, and this and the facts above cannot be uninteresting to the physician.

Is not the evolution of this substance connected with the presence of uric acid; and is not this and one not the artites alluded to above, ~~the~~ results of its spontaneous decomposition?

O

Can

The preparations
are few and sim
help from the dis
their fate to accor
of making new on

For comm
moderate heat with
some apothecaries,
in fine powder,
is liable to some
substance of the c
having some places
part of the surface
with vinegar or
principle.

We know that th
solution, thro water
may be supposed to
all the analyses go
trouble menstruum
better. They are al

Of the Preparations of Cantharides used for blisters.

The preparations of this substance for the purpose of blistering are few and simple. Nor do we find very material helps from the discoveries of the Chemists. It is very often their fate to account for the discoveries of accident, instead of making new ones.

For common use, it is mostly mixed over a very moderate heat with diachylon, or with a resinous ointment. Some apothecaries, with a view of saving a costly article, spread it, in fine powder, over the surface only of the plaster. But this is liable to some objections, as the powder, if rubbed into the substance of the cerate, is apt to become unequally spread, leaving some places nearly bare. Mostly, however, it covers a great part of the surface, in a dry and inactive form. This is sprinkled with vinegar or water, to bring into play the vesicating principle.

We know that this matter can be diffused, by a process like solution, thro' water, and, no doubt, thro' vinegar, which last may be supposed to assist its action on the body. But, from all the analyses given, oils would seem to be the most unexceptionable menstruum; and this gives the preference to the compound plasters. They are also neater, and can be applied repeatedly

without being spoiled. O
a last, if sufficient
n down in streaks,
scattered drops onl
r the whole plaster
ters, even when in
fail to draw comp
in one moistened with
usual appearances.
ter adapted than a
it spends and soften
is way economy ma
When required to draw
t, in the Hospital
ck, — Dr. Harten
ntharides. This, where
ver failed. It is m
ts of turpentine w
t the virtue of the
beautiful brown colo
ceptible along with
l for any other purp
is often urged to the
all points like pimple
typhoid fevers; many

without being spoiled. In using the other kind with watery fluids, these last, if sufficient in quantity to imbue the whole surface, run down in streaks, and irritate where not intended. When in scattered drops only, they cannot afford a menstruum for the whole plaster, and it acts imperfectly. These blisters, even when in the most favourable circumstances, very often fail to draw completely over their whole surfaces. I have applied one moistened with sweet oil, and it drew very well, presenting the usual appearances. This substance, I cannot help thinking better adapted than any other, for imbuing such applications, as it spreads and softens the whole surface of the plaster. In this way economy may be studied with advantage.

When required to draw with certainty and rapidity, they are wet, in the Hospital, with the article of which I next speak, — Dr. Hartshorne's tried infusion of decoction of cantharides. This, where there is sufficient life in the part, has never failed. It is made by boiling for 3 hours, ℥viii. of spirits of turpentine with ℥j. of cantharides. It does not extract the virtue of the drug at less than a boiling heat. It is of a beautiful brown colour, and the smell of the cantharides is perceptible along with that of the turpentine. This is rarely used for any other purpose than as a powerful rubefacient, and is often urged to the degree of producing vesication in small points like pimples. It forms a gigantic remedy in the typhoid fevers; many cases, apparently hopeless, having been

ought by it to a succe
ving the life of

"Dur
"Tum

When pushed to a p
irritation more tho
st of the discharg
ntioned in treating
medy, were produce
surfaces looked perfect
ceptiny a little tig
This preparation
th Rentish's liniment
dispersion. It is pec
convenience and
From being obliged
l, and from a wish to
d me to experiment
was unable, in see
fluid at all. The
ke I imagined that
To prove that this cha
nt in the oil, I sou
same hand-bath wit
It was unchanged in

brought by it to a successful issue. It failed, however, in preserving the life of Rush!

"Quis desiderio sit pudor aut modus
"Tam cari capitis."

When pushed to a full blister, it should seem to produce irritation more than proportionate to the quantity or effect of the discharge. The two milder of three severe cases, mentioned in treating of the medical application of the remedy, were produced by this in 4 or 5 hours. The inflamed surfaces looked perfectly like those from common applications, excepting a little lighter hue.

This preparation has been used with advantage, mixed with Kentish's liniment, for burns accompanied with great depression. It is peculiarly fit for use in mortification, from it's convenience and the certainty of it's effect.

From being obliged very frequently to dilute it with sweet oil, and from a wish to avoid the smell, Dr. Hartshorne requested me to experiment with a decoction in the latter substance. I was unable, in several attempts, to produce a blistering fluid at all. The oil blackened, & assumed a strong smell, like I imagined, that of Cantharides putrid or empyreumatic. To prove that this change took place in the cantharides and not in the oil, I subjected some of the latter to heat in the same sand-bath with a parcel containing the powder. It was unchanged in colour, & but little affected in sensible

ualities by a heat
other.

There is an other
, as raising a blis
on myself and a
than 5 hours;
n that of Dr
e worst of those
ed on myself, 15
ter 5 hours after
stance of the
To accelerate the
ack pepper and
ng is to apply a
turpentine may
cantharis vittata bl
hen there are conti
texture, we are
inflamed surface,
this list we must no

O
variety of other sp
known American
ranica, the Latin vittata
two species, one a ver

qualities by a heat that produced all the effects above recited upon the other.

There is an ethereal tincture, mentioned in the French dictionary, as raising a blister in ten minutes: I made it and tried it on myself and another. No such effect was produced in less than 5 hours; but it's action was somewhat more violent than that of Dr. Hawthorne's decoction. It produced the worst of those three cases mentioned above. In one trial on myself, 15 minutes' application produced a full blister 5 hours after; probably from remaining in the substance of the cuticle.

To accelerate the action of cantharides, verdigris, mustard, black pepper and euphorbium have been used. A good way is to apply a sinapism first, and then a blister. The decoction in turpentine may be added; and according to Dr. Schott, the Cantharis vittata blisters much sooner. We must reflect that, when these are continued after the cuticle separates, or remain in it's texture, we are applying a stimulus of much greater violence to the inflamed surface, than mere Cantharides.

To this list we must not forget to add, the action of friction.

Of Substitutes.

A variety of other species of Cantharis are capable of raising blisters. The known American species are C. vittata, C. marginata, C. pennsylvanica, (the Lytta atrata of the Linnæans,) and C. cinerea; besides 3 other species, one a very large one, in the collection of T. Say, esq.

ve ever described a
It has been proposed
, tenebrio, cicindel
hich is now use
the ancients.

Different vegetabl
pose, such as the
, anemone, &c.
ence apt to be follo
The ranunculus sceler
ended by the prese
be used in cases req
ne, his illustrious pr
es of bites from poi
he are directed to be s
applied to a part
Horse-radish, the
e ammonia in so
ter, but it is to be hoped
eculiar circumstanc
garlic as a rubefa
Mustard will blister,
intolerable pain prec
In cases where an i
n used. It is said to p

were ever described and published.

It has been proposed to try the genera melos, mylabrum, ocrabeus, tenebrio, cicindela and coccinella. The mylabrum cichorei is now used by the Chinese, and is said to be the blister of the ancients.

Different vegetables have been proposed and used for our purpose, such as the genera euphorbia, ranunculus, clematitis, anemone, &c. It is, however, objected by Barbier, that they are apt to be followed by deep ulcerations, difficult of cure. The ranunculus sceleratus, common with us, has been recommended by the present professor Barton, as a prompt remedy, to be used in cases requiring immediate effects. With the same view, his illustrious predecessor advised the Daphne Gnidium, in cases of bites from poisonous snakes. The D. Mezereum & D. Laureola are directed to be steeped in vinegar; & the bark to be peeled off, and applied to a part previously moistened with vinegar.

Horse-radish, the polygonum hydropiper, pure acetic acid, pure ammonia in solution, & even garlic are all said to blister, but it is to be hoped, will not be employed, unless in very peculiar circumstances. This is not to militate against the use of garlic as a rubefacient.

Mustard will blister, particularly with the addition of salt; but the intolerable pain precludes this use forever.

In cases where an instant blister is required, boiling water has been used. It is said to produce a more exclusively local effect.

yet unpublished. c
virtues have been
ay have been report
all agree that it
ow Spain. Dr.
ever left it on long
Dr. Hawthorne's
is, at all events,
ind is not to be ha
By the kindness of
enabled to prefix a
definition, from
C. fusca, elytris
my specimens, ho
stripes, was dark b
ck eyes, and two bl
y, dark brown. c
ake-root, &c.
The C. marginat
ake-snake-root, th
genus that they are
t species is mentio
covered by him, n
perior to the Span
Joseph Banks,

Eclectic Repertory

and yet unpublished. The fame of the first one is now settled, and it's virtues have been subjected to the ordeal of experience. It's virtues have been reported differently by different physicians; but they all agree that it is at least nearly equal to Cantharides from Spain. Dr. Schott* found it blister in 4 or 5 hours, and never left it on longer than 7. A decoction of it, in imitation of Dr. Hawthorne's blistered when rubbed on, in ten minutes. It is, at all events, the proper substitute, where the common kind is not to be had.

By the kindness of the lately mentioned entomologist, I am enabled to prefix a drawing of this insect, male & female. It's definition, from the French Encyclopedia, is as follows.

C. fusca, elytris nigris, vitta marginibusque flavis.

In my specimens, however, the colour of the animal besides the yellow stripes, was dark brown and not black. Head, yellow, with black eyes, and two black stripes down the middle of the forehead. Legs, dark brown. It is found on potatoes, peas, the black-snake-root, &c.

The C. marginata I have found in abundance on the black-snake-root, the Actaea spicata. It is characteristic of the genus that they are sluggish and easily caught.

A species is mentioned by Dr. Burt of the British army, as discovered by him, at Muttra in the East Indies, and superior to the Spanish fly. Specimens, he says, were sent to Sir Joseph Banks; but I have never heard that they

* Eclectic Repertory; vol. 2. p. 143.

The matters method of u
not recommended by
water full & covered
a few minutes.
In the whole there a
substitutes. Suddenn
upon the use of the
phones; if these eat
ether in turpentine
always be at hand, as
The cantharis vittata
with the vesicato
time day offering a
more than has alr
ties & of Arctaeus.
the barbarous nam
some species more a
India melve of
but till it is developed
selves with prescribin
by repetition & justi

The neatest method of using it with which I am acquainted is that recommended by the late Dr. Rush; viz, applying a cup quite full & covered with a single fold of cloth. He directs it continued a few minutes.

On the whole there is, at present, not much use to be made of substitutes. Suddenness of operation may, in remote places, render proper the use of the ranunculus sceleratus or of some of the Daphnes; if these really act any quicker than decoction of cantharides in turpentine. Hot water, in extreme cases, will always be at hand, as a last resort.

The cantharis vittata may, perhaps, be considered as of indifferent use with the vesicatoria. I do not despair, indeed, of some future day offering an article to supersede them both. This is no more than has already occurred since the times of Hippocrates & of Aretaeus. There must, among the lytta, mylabra, & other barbarous names with which the catalogues abound, lurk some species more active than these, or even than the East-India melve of Dr. Burt. But for this we must wait till it is developed by accident & time; & content ourselves with prescribing, like our fathers, medicines known by repetition & justified by successful experience.